SCREAMIN' EAGLE 6-SPEED GEARSET

GENERAL

Kit Number

33101-03A

Models

For model fitment information, see the P&A Retail Catalog or the Parts and Accessories section of www.harley-davidson.com (English only).

Additional Parts Required

For Cable Actuated Clutch: SE 6-Speed Cable Clutch Side Cover and Release Pushrod Kit Part Number 38752-04.

For Hydraulic Clutch: Hydraulic Cable Side Cover and Release Pushrod Kit Part Number 38753-04A.

1990- mid 1994 models use a wider sprocket spacer Part Number 33334-85 and mainshaft oil seal Part Number 12050. These parts are not included with the kit and will need to be purchased separately. If a newer model sprocket is used 40250-94C, the mainshaft oil seal and the sprocket spacer in the kit may be used.

⚠WARNING

The rider's safety depends upon the correct installation of this kit. Use the appropriate service manual procedures. If the procedure is not within your capabilities or you do not have the correct tools, have a Harley-Davidson dealer perform the installation. Improper installation of this kit could result in death or serious injury. (00333a)

NOTE

This instruction sheet references service manual information. A service manual for your model motorcycle is required for this installation and is available from a Harley-Davidson Dealer.

Kit Contents

See Figure 8 and Table 2.

Table 1. Gear Ratios

GEAR	STOCK 5-SPEED	SE 6-SPEED
First	3.210	3.210
Second	2.209	2.209
Third	1.572	1.572
Fourth	1.226	1.226
Fifth	1.000	1.000
Sixth	N/A	0.885

REMOVAL

NOTES

Leave the transmission case in the frame unless the case itself requires replacement. For ease of illustration, photographs show the case removed.

Use the appropriate service manual for the following procedures.

1. Drain the primary chaincase and transmission lubricants.
2. Remove battery negative cable (black) from battery negative (-) terminal.
3. Remove the primary chaincase cover. Remove the clutch assembly, primary chain and compensating sprocket components. Remove the starter jackshaft assembly and primary chaincase.
4. Remove the exhaust system as necessary to gain complete access to the transmission side door.
5. Remove the oil filler spout and starter.
6. Remove the clutch release cover. Remove the clutch cable from the clutch release cover.
7. Remove the vehicle speed sensor.
8. Remove the transmission top cover:
   a. Remove neutral switch from transmission top cover.
   b. Remove the drum support blocks and shift drum. Remove the drum support block dowels from deck of transmission case.
   c. Remove the fork shaft and shifter fork assemblies.
   d. Remove the bearing inner race from the transmission mainshaft.
   e. Remove the transmission side door and the mainshaft/countershaft assembly.

      The front dowel pin may be stuck in the side door after removal. If this occurs, remove the dowel pin from the side door and install it back into the transmission case.
   f. Remove the shifter shaft assembly and shifter seal.

NOTE

Use the appropriate service manual for the following procedures.

9. Remove the main drive gear and bearing.
10. Remove the countershaft needle bearing.
11. Using masking tape, cover all the side door flange holes in the transmission case with the exception of the top three.

NOTE

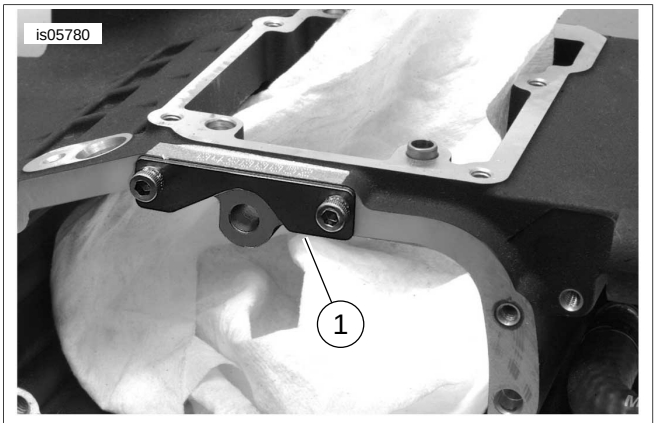
While the two threaded holes at the top of the flange are used for mounting of the drill plate, the fork shaft hole (center thru hole) is used as the pilot for the drill bits.

12. From inside the transmission case, tape over all bores as follows:

- Vehicle speed sensor and mounting screw bores.
- Transmission top cover and shift drum support block screw bores.
- Transmission drain hole bore.
- Main drive gear bearing bore.
- Countershaft needle bearing bore.
- Fork shaft bore.
- Shifter shaft bore.

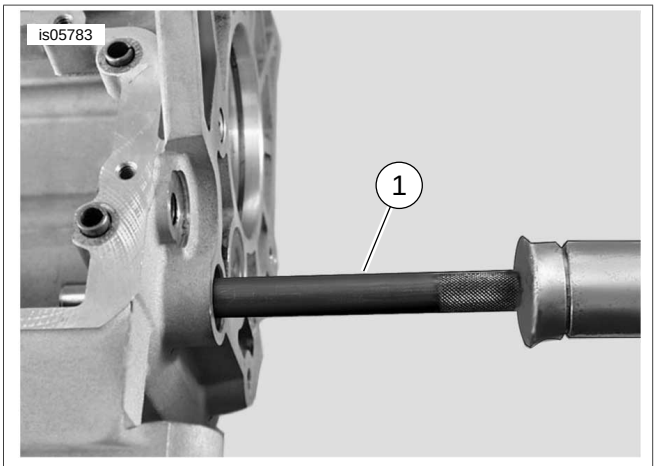
NOTE

Be sure drill plate is properly oriented. Improper orientation will result in damage that requires replacement of the transmission case.



1. Drill plate

Figure 1. Install Drill Plate to Transmission Case



1. Shifter shaft sleeve remover

Figure 2. Remove Shifter Shaft Sleeve

13. See Figure 1. Obtain the drill plate (1) provided in kit and fasten to top of side door flange using old and new vehicle speed sensor mounting screws.
14. Spread one or two clean shop cloths inside the transmission case to catch the metal shavings and debris.
15. Starting with a 3/8-inch drill bit, alternately use progressively larger bits to enlarge the fork shaft hole. Finish the drilling operation with a 3/4-inch drill bit.
16. Remove all remaining material up to the edge of the drill plate with a die grinder or similar tool. Remove the drill plate.
17. Using emery cloth, steel wool, or a fine tooth file, remove any burrs or ridges that may exist from the drilling or cutting operation.
18. Remove sleeve from shifter shaft bore. Proceed as follows:
    a. Obtain shifter shaft sleeve remover/installer tool provided in kit.
    b. See Figure 2. From the outside of the transmission case (left side), insert smaller diameter end of remover into shifter shaft sleeve (knurled side out). Using a 30 ounce brass hammer (minimum), tap the end of the remover with light blows until the shifter shaft sleeve is free of the transmission case.
    c. Carefully remove any burrs from in or around the sleeve bore.

NOTE

Abrasive particles can damage machined surfaces and result in premature failure.

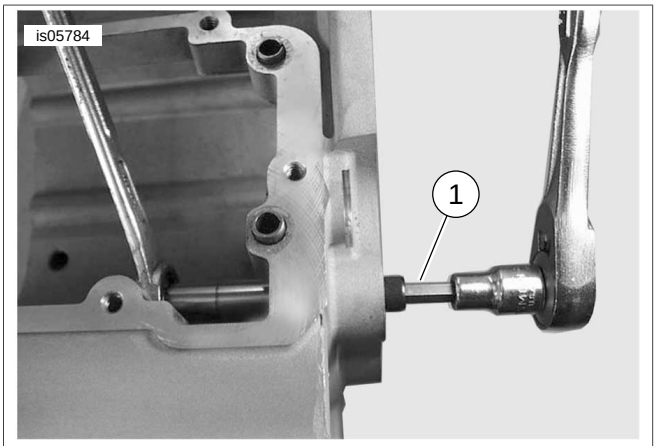
19. Carefully pull out shop cloths from inside the transmission case. Exercise care to keep any debris captured by the cloths from falling into the transmission case.
20. Place drain pan beneath transmission case and remove tape from drain hole. Thoroughly flush the transmission case with a non-volatile cleaning solution or solvent to remove any metal shavings, dust or debris that might remain. For best results, use a squirt bottle to direct a stream of solvent through the transmission top cover opening. Repeat procedure as necessary draining excess solvent through the drain hole.
21. Using low pressure compressed air, thoroughly blow out all solvent.
22. Using a clean lightly oiled cloth, thoroughly wipe the inside of the transmission case. Repeat this step with a new cloth until the cloth comes out clean.
23. Carefully inspect the transmission case for any metal shavings or debris. Repeat steps 19 through 21 if any debris is found.
24. Remove the masking tape to uncover remaining holes and bores.
25. Thoroughly inspect each bore for any metal shavings, dust or debris. Alternately direct compressed air into each bore to be certain that the transmission case is clean and dry.

INSTALLATION

NOTE

Prelube all bearings and shafts with clean transmission lubricant prior to installation.

1. Using the appropriate service manual, proceed as follows:
   a. Install the countershaft needle bearing.
   b. Install the main drive gear and bearing.



1. Shifter shaft sleeve installer

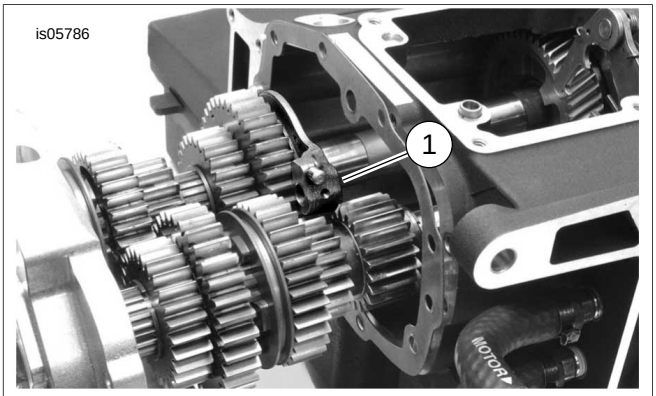
Figure 3. Install Shifter Shaft Sleeve

2. Using the appropriate service manual, proceed as follows:
   a. Obtain shifter shaft sleeve remover/installer tool provided in kit.
   b. See Figure 3. Place new sleeve over installer (1). Place thrust washer, thrust bearing and then the second thrust washer onto installer screw.
   c. Apply a very thin film of HD 20W50 engine oil to OD of new sleeve, ID and OD installer threads and ID of sleeve bore. Also apply a very thin film of HD 20W50 engine oil to the thrust bearing and thrust washers.
   d. From inside the transmission case, hold the sleeve and installer against the sleeve bore. From outside the transmission case, thread the installer screw assembly into the installer keeping the sleeve properly aligned.
   e. Using a 3/4-inch box wrench, hold the hex on the installer inside the transmission case.
   f. Using a 1/4-inch hex head, tighten the installer screw until the sleeve stops against the first thrust washer.
   g. Remove the tool from the transmission case.
   h. Apply a very thin film of HD 20W50 engine oil to sleeve ID and new shifter shaft. From outside the transmission case, slide shaft through sleeve and then rotate. Shaft must rotate freely a full 360 degrees. Remove shifter shaft assembly.
   i. Install the new shifter seal. Install shifter shaft assembly from inside the transmission case. Install new shifter seal washer and new retaining ring.

NOTES

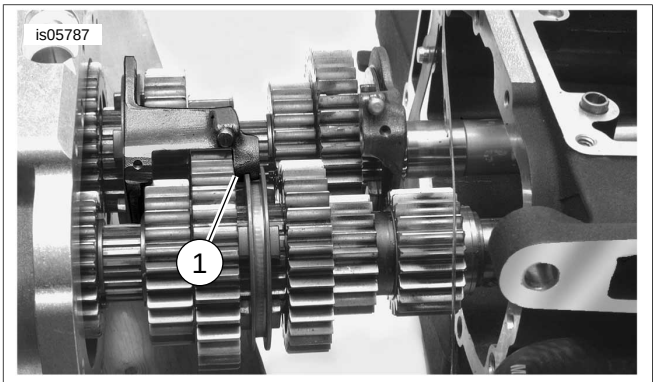
Leave the shrink wrap on the mainshaft until side door installation is complete. Installation of the side door with the shrink wrap removed may result in damage to the main drive gear seal.

Be sure to remove the plastic cap and cable strap from the mainshaft before side door installation. Blow away any styrofoam bits or other packaging material that might be clinging to gears or splines.



1. Shifter fork

Figure 4. Install 5-6 Shifter Fork to Shift Ring



1. Shifter fork

Figure 5. Install 3-4 Shifter Fork to Shift Ring

3. Install the transmission side door and mainshaft/countershaft assembly as follows:
   a. Hang new side door gasket on dowels in side door flange of transmission case.
   b. Start side door and mainshaft/countershaft assembly into transmission case, but stop so that all gears remain on the outboard side.
   c. Note that there are three shifter forks, each of which are stamped for easy identification. Set aside the 5-6 shifter fork, the 3-4 shifter fork and the 1-2 shifter fork in that order.
   d. See Figure 4. Install the 5-6 shifter fork (1) into the shift ring outboard of the 6th gear on the mainshaft (shift ring closest to the main drive gear).
   e. See Figure 5. Install the 3-4 shifter fork (1) into the shift ring between the 4th and 3rd gears on the mainshaft (shift ring closest to the side door). Be sure the dogs on the shift ring are engaged with mainshaft 3rd gear and then rotate shifter fork toward the

countershaft until the slot in the fork engages the edge of the shift ring between 1st and 2nd gears on the countershaft. This engagement is necessary to obtain the proper clearance for side door installation.

f. Slide side door assembly further into transmission case stopping about one inch before mating flanges make contact.

g. Start fork shaft through hole in side door.

h. See Figure 6. Through the transmission top cover opening, install the 1-2 shifter fork (1) into the shift ring between 1st and 2nd gears on the countershaft. For proper clearance, be sure the dogs on the 3-4 shift ring (closest to side door on the mainshaft) are fully engaged with mainshaft 4th gear.

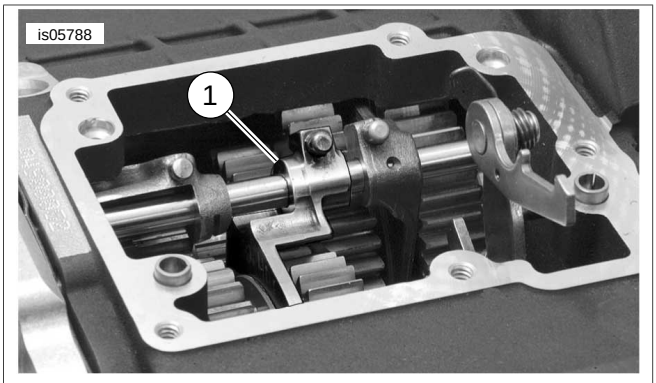
i. Install new side door plug into side door.

j. Slide fork shaft through holes in shifter forks and then fully install side door. Be sure that end of fork shaft engages blind hole on left side of transmission case.

k. The fork shaft set screw is a lock-patch type set screw and is designed to allow the fork shaft to have minimum endplay but still rotate freely. DO NOT tighten fork shaft set screw against fork shaft. Damage could result if set screw is tightened against fork shaft.

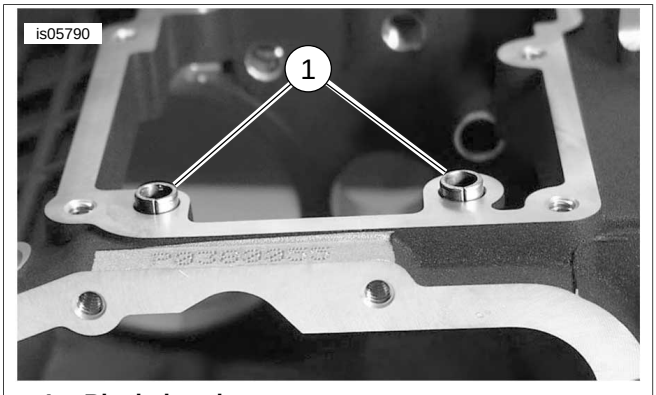
Install fork shaft set screw in transmission side door. Tighten screw until the shaft has minimum endplay, but still rotates freely.

l. Remove shrink wrap from the mainshaft.



1. Shifter fork

Figure 6. Install 1-2 Shifter Fork to Fork Ring



1. Block dowels

Figure 7. Orient Shift Drum Support Block Dowels

4. Using the appropriate service manual, proceed as follows:
   a. See Figure 7. Install four new drum support block dowels (1) in deck of transmission case. Orient the dowels so that the split line is aligned left to right.
   b. Install new drum support blocks with new shift drum.
   c. Rotating output shaft by hand, shift through all six gears to verify proper operation. Input shaft may need to be rocked back and forth to get all gears to shift.
   d. Install the mainshaft oil seal, quad seal, spacer sleeve/sprocket spacer, sprocket, and sprocket nut.
   e. Install the new bearing inner race onto the transmission mainshaft.
5. Install the transmission top cover with new gasket. Verify that the shifter pawl does not contact the inside of the top cover during installation.
   a. See Figure 8. Install new neutral switch into the transmission top cover. For 1998 or later models or if you are replacing the stock top cover with a 1998 or later model top cover, DO NOT remove the O-ring. For 1990- 1997 model years, remove the O-ring from the neutral switch and install the aluminum washer (67) with the chamfer side of washer away from the switch body followed by the nylon washer (68) on the neutral switch. These parts are included in the bag with your neutral switch. Install the neutral switch into top cover and tighten to 120-180 in-lbs (13.6-20.3 Nm).
   b. Install connectors on neutral switch studs. For 1990 thru 1997 model years, refer to the wiring diagram at the back of the service manual. The wiring harness for these years has a single cap connector (H-D part number 9905) connected to the neutral switch. Replace the single cap connector as follows in the next four steps.
   c. Cut single cap connector off stock wire.
   d. Connect the supplied wire (56) to the cut wire with the supplied connector (58) and attach onto either pole of the neutral switch.
   e. Attach the other supplied new wire (55) to the remaining pole.
   f. Attach the supplied ring terminal (57) to the other end of the new wire and attach to a convenient grounding location.
6. Install the starter and oil filler spout.
7. Install the exhaust system.
8. Install the primary chaincase and starter jackshaft assembly. Install the clutch assembly, primary chain, and compensating sprocket components. Install the primary chaincase cover.
9. Install drain plugs and fill the transmission and primary chaincase with the recommended lubricant.
10. Install plate with gasket over vehicle speed sensor bore in transmission case using stock hardware.
11. Install vehicle speed sensor at top of transmission side door using new O-ring.

12. Install side cover.

    For **Cable Actuated Clutch :** Follow the instructions in the SE 6-Speed Cable Clutch Side Cover and Release Pushrod Kit (Part Number 38752-04).

    For **Hydraulic Clutch :** Follow the instructions in the Hydraulic Cable Side Cover and Release Pushrod Kit (Part Number 38753-04), and in the Hydraulic Clutch Kit (Part Number 45033-03, Black or 45383-03, Chrome).

13. Install battery negative cable (black) to battery negative (-) terminal.

Transmission Service

1. Replace the transmission lubricant after the first 500 miles. Thereafter, refer to the service manual and change the lubricant at the recommended service intervals.

SERVICE PARTS

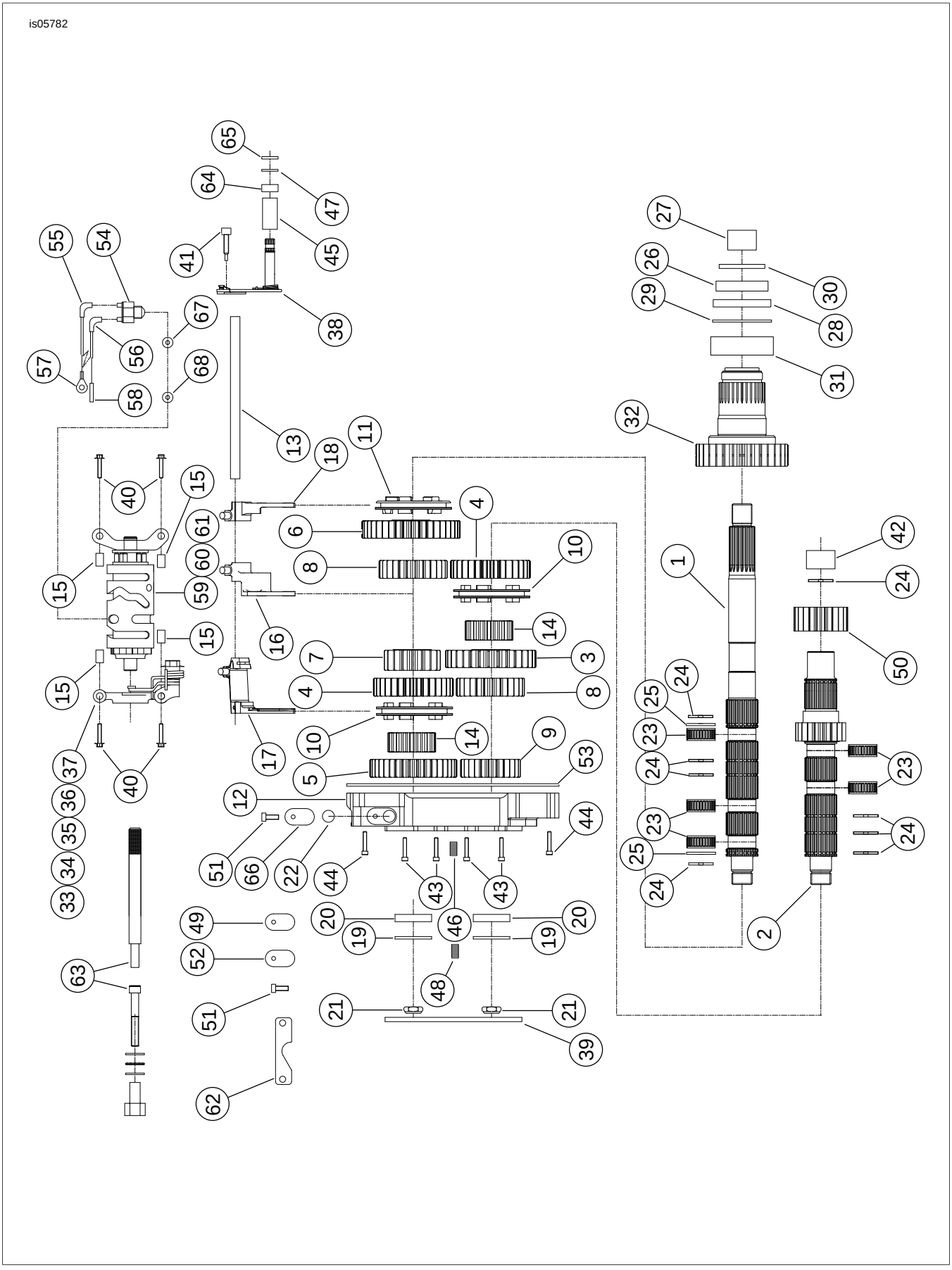


Figure 8. Service Parts: 6-Speed Gearset

Table 2. Service Parts: 6-Speed Gearset

Item	Description (Quantity)	Part Number
1	Mainshaft	35058-03
2	Countershaft	35059-03
3	Countershaft 1st Gear	35080-03
4	Mainshaft 3rd Gear/Countershaft 2nd Gear (2)	35083-03
5	Mainshaft 4th Gear	35104-03
6	Mainshaft 6th Gear	35131-03
7	Mainshaft 1st Gear	35134-03
8	Countershaft 3rd Gear/Mainshaft 2nd Gear (2)	35135-03
9	Countershaft 4th Gear	35136-03
10	Shift Ring, 1-2, 3-4 (2)	35137-03
11	Shift Ring, 5-6	35138-03
12	Side Door	35158-03
13	Shifter Fork Shaft	34088-87A
14	Splined Sleeve (2)	35140-03
15	Drum Support Block Dowel (4)	609
16	Shifter Fork, 1-2	35143-03
17	Shifter Fork, 3-4	35144-03
18	Shifter Fork, 5-6	35145-03
19	Side Door Bearing Retaining Ring (2)	35087-99A
20	Side Door Bearing (2)	8992A
21	Mainshaft/Countershaft Locknut (2)	35078-79
22	Speed Sensor O-Ring	11289A
23	Split Cage Bearing (5)	8876A
24	Retaining Ring (8)	11067
25	Thrust Washer (2)	6003
26	Sprocket Spacer	33344-94
27	Mainshaft Inner Race	34091-85A
28	Oil Seal, Large	12067B
29	Bearing Retaining Ring	11161
30	Quad Seal	11165
31	Main Drive Gear Bearing	8996A
32	Main Drive Gear	35237-03
33	Right Drum Support Block	33304-00
34	Detent Arm Screw	33376-00
35	Detent Sleeve	33375-00A
36	Detent Follower	33364-00A
37	Detent Arm Spring	33374-00
38	Shifter Shaft Assembly	35146-03
39	Clutch Release Cover Gasket	35148-03
40	Drum Support Block Screw (4)	3909
41	Shifter Centering Screw	34978-00A
42	Countershaft Needle Bearing	8977
43	Lower Side Door Screw (4)	3249
44	Upper Side Door Screw (2)	4814A
45	Shifter Shaft Sleeve	34979-00

Table 2. Service Parts: 6-Speed Gearset

Item	Description (Quantity)	Part Number
46	Side Door Plug	45830-48
47	Shifter Seal Washer	6497HW
48	Shifter Fork Shaft Set Screw	3784
49	Speed Sensor Plate Gasket (2)	35152-03
50	Countershaft 5th Gear	35238-03
51	Speed Sensor Plate Screw (2)	4705
52	Speed Sensor Plate (2)	35153-03
53	Side Door Gasket	35147-03
54	Neutral Switch	33904-00
55	Black Wire Assembly	72405-98BK
56	Tan Wire Assembly	72405-98TN
57	Ring Terminal, 1/4 Inch	72241-94A
58	Connector (18-20 Gauge)	70585-93
59	Shift Drum	35142-03
60	Left Drum Support Block	33301-00A
61	Shift Drum Retainer	11342
62	Drill Plate	35155-03
63	Shifter Shaft Sleeve Remover/Installer Tool	35156-03
64	Shifter Seal	12045
65	Shifter Retaining Ring	11150
66	Speed Sensor Plug	35239-03
67	Neutral Switch Washer, Aluminum	6288
68	Neutral Switch Washer, Nylon	33043-80
Items Not Shown		
Top Cover Gasket, FLHT and FXST		34904-86D
Oil Fill Spout Gasket, FLHT 1993 and Later		62432-93B